



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/644,255

08/20/2003

Mark Cullen

CULLN-001B

6075

7590

06/28/2007

MATTHEW A. NEWBOLES  
STETINA BRUNDA GARRED & BRUCKER  
Suite 250  
75 Enterprise  
Aliso Viejo, CA 92656

EXAMINER

NGUYEN, TAM M

ART UNIT

PAPER NUMBER

1764

MAIL DATE

DELIVERY MODE

06/28/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

---

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/644,255  
Filing Date: August 20, 2003  
Appellant(s): CULLEN, MARK

**MAILED**  
**JUN 28 2007**  
**GROUP 7**

Matthew A. Newboles  
For Appellant

**MAILED**  
**JUN 28 2007**  
**GROUP 1700**

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed October 5, 2006 appealing from the Office action mailed September 8, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

U.S Patent Application Numbers: 10/411,796 and 10/429,369.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

1. The rejection of claims 40-88 under 5 U.S.C. § 112, first paragraph regarding the A) generic nature of Appellant's upgrading step and B) the office position that a phase separation step is required in the claims. (See Appellant's remarks pages 7-15 of the Brief on Appeal).

Art Unit: 1764

2. The rejection of claims 41 and 48-51 under 5 U.S.C. § 112, second paragraph.

3. The judicially reacted doctrine of obviousness-type double patenting rejection of copending Application No. 10/429,369, 10/411,769, and 10/431,666.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,500,219	Gunneman	12-2002
3,616,375	Kiyoshi Inoue	10-1971

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 40-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunneman et al. (6,500,219).

Gunneman discloses a process for removing sulfur from a hydrocarbon feed (e.g., crude oil, diesel, gas oil, gasoline) by preheating the feed and contacting it with an oxidizing agent while exposing the feed to sonic energy and catalyst comprising nickel or tungsten. The process is operated at residence time of from about 0.3 to about 30 minutes, at a temperature of from 70-80° C, and at about atmospheric pressure. (See col. 3, lines 18-45; col. 4, lines 38-47; col. 5, line 23 through col. 6, line 37; example 1)

Gunneman does not disclose that the process is operated in the absence of an aqueous phase.

It is Examiners position that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Gunneman by

Art Unit: 1764

operating the process in the absence of an aqueous phase if the function of the aqueous phase is undesirable. See *Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989). See also *In re Larson*, 340 F.2d 965, 144 USPQ 347 (CCPA 1965); and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby eliminating its function was an obvious expedient).

Claims 58-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunnerman et al. (6,500,219).

Gunnerman discloses a process for removing sulfur from a hydrocarbon feed (e.g., crude oil, diesel, gas oil, gasoline) by preheating the feed and contacting it with an oxidizing agent while exposing the feed to sonic energy and catalyst comprising nickel or tungsten. The process is operated at residence time of from about 0.3 to about 30 minutes, at a temperature of from 70-80° C, and at about atmospheric pressure. (See col. 3, lines 18-45; col. 4, lines 38-47; col. 5, line 23 through col. 6, line 37; example 1)

Gunnerman does not disclose that the process is operated in the absence of a surface active agent.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Gunnerman by operating the process in the absence of an a surface active agent if the function of the aqueous phase is undesirable. See *Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter.1989). See also *In re Larson*, 340 F.2d 965, 144 USPQ 347 (CCPA 1965); and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby eliminating its function was an obvious expedient).

Art Unit: 1764

Claims 78-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunnerman et al. (6,500,219).

Gunnerman does not disclose that the process is operated in the absence of an oxidizing agent.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Gunnerman by operating the process in the absence of an oxidizing agent if the function of the aqueous phase is undesirable. See *Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989). See also *In re Larson*, 340 F.2d 965, 144 USPQ 347 (CCPA 1965); and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby eliminating its function was an obvious expedient).

Claim 76 and 83-88 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (3,616,375).

Inoue discloses a desulfurization process wherein a hydrocarbon feed (e.g., crude oil) is contacted with ultrasonic energy. The process is operated at ambient temperature and pressure. (See col. 1, lines 27-38; col. 2, lines 20-44; col. 5, lines 5-8; Examples I-V)

Inoue does not disclose that the feed is heated while exposing the crude oil fraction to sonic energy.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Inoue by heating the feed to couple degrees in temperature because it would be expected that the results would be the same or similar when operating the process at either ambient temperature (e.g., 28° C) or 35° C.

Art Unit: 1764

Claims 77-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (3,616,375) as applied to claim 76 above, and further in view of Gunnerman et al. (6,500,219).

Inoue does not specifically disclose a feed as claimed in claims 77-81.

The process of Gunnerman is as discussed above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Inoue by utilizing a feedstock as taught by Gunnerman because any sulfur containing hydrocarbon feed can be treated in the process of Inoue.

Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (3,616,375) alone or in view of Gunnerman et al. (6,500,219).

Inoue does not disclose that the process has a residence time of from 1 second to 1 minute.

The process of Gunnerman is as discussed above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Inoue by operating the process at the claimed residence times because Inoue teaches that the process is durable to release at least part of the sulfur from the hydrocarbon feed. Therefore, it would be expected that at least one sulfur would be released from the feedstock when the resident time is 1 minute.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Inoue by operating the process at the residence times as taught by Gunnerman because such residence times are effective in the process.

#### **(10) Response to Argument**

In review, the process of Gunnerman involves a process for upgrading a hydrocarbon feed (e.g., fossil fuels) by utilizing a sonic energy with an aqueous phase, a surface active agent, and oxidizing agent. Claims on appeal are vastly different than those originally filed which required addition of a hydroperoxide oxidizing agent to the Crude fraction and the separation of nitrogen and sulfur compounds

#### Claim 40

Appellants independent claim 40 comprises upgrading an crude oil fraction by exposing it to sonic energy in the absence of an aqueous phase.

Examiner agrees with Appellant's characterization of Gunnerman with respect to claim 40 in that Gunnerman teaches the use of a hydroperoxide oxidizing agent and that an aqueous phase is formed in Gunnerman.

While Examiner acknowledges that Applicants Claim 40 on appeal now specifically excludes an aqueous phase

The examiner's position is that an upgrading product as claimed would still obtain from the process of Gunnerman when an aqueous phase is omitted from the process because an aqueous phase is only to improve the effectiveness and efficiency of the process. Without the use of an aqueous phase, Examiner maintains that the separation would still occur, but it would not be easily and ready as compared when it is involved with an aqueous phase. Note that omission of an element and its function is obvious if the function of the element is not desired. See *ex parte Wu* 10 USPQ 2031.



Moreover, Appellants in response to the 112 second paragraph rejection regarding H<sub>2</sub>O<sub>2</sub> addition (see the argument on page 17 of the Brief) admit that “hydrogen peroxide, if present at all can be present in an as low as 0.0003 % by volume.” Also, at the bottom of page 16, of the Brief on Appeal, Appellant acknowledges that a “person skilled in the art would understand the limitation of in the absence of an aqueous phase to allow for the addition of a reagent, such as hydrogen peroxide, in an aqueous carrier that creates at most a negligible aqueous phase.” In view of these admissions by Appellant, the meaning of “in the absence of an aqueous phase” per claim 40 is therefore inclusive of an aqueous phase and therefore embrace by Gunnerman. The additional limitations per claims 41- 57 with respect to the prior art are uncontroverted by Appellant and therefore stand or fall with independent claim 40.

Claims 41-57:

The present invention involves a process for upgrading a hydrocarbon feed (e.g., fossil fuels) by utilizing a sonic energy with, optionally, an aqueous phase, a surface active agent, and an oxidizing agent.

The process of Gunnerman involves a process for upgrading a hydrocarbon feed (e.g., fossil fuels) by utilizing a sonic energy with an aqueous phase, a surface active agent, and oxidizing agent.

The examiner’s position is that an upgrading product as claimed would still obtained from the process of Gunnerman when an aqueous phase, a surface active agent, or oxidizing agent is omitted from the process because an aqueous phase, a surface active agent, or oxidizing agent is only to improve the effectiveness and efficiency of the process.

Art Unit: 1764

The argument that Gunnerman does not teach a process involved sonic energy in the absence of an aqueous phase and there is no evidence supporting the motivation to modify the Gunnerman reference to be practiced without the use of an aqueous phase is not persuasive. It is general knowledge is that the aqueous phase used in the process of Gunnerman to enhance the separation. Without the use of an aqueous phase, the separation would still occur, but it would not be easily and ready as compared when it is involved with an aqueous phase. Also, Appellants have in response to the 112 second paragraph rejection regarding H<sub>2</sub>O<sub>2</sub> addition (see the argument on page 17 of the Brief) that the limitation “in the absence of an aqueous phase” would indeed include an amount of aqueous phase as low as 0.0003 % by volume. Since Gunnerman teaches that the process is employed an amount of aqueous phase as low as 0.0003 % (see Gunnerman: col. 4, lines 38-57) as admitted by Appellant, the limitation “in the absence of an aqueous solution” is embraced by Gunnerman.

Claims 58-75:

The argument that Gunnerman does not disclose that the process is operated in the absence of a surface active agent and there is no evidence supporting the motivation to modify Gunnerman to be practiced without the use of a surface active agent is not persuasive. The examiner maintains that the use of a surface active agent in the process Gunnerman is to create emulsion to enhance the separation. Without the use of a surface active agent, the separation in the process of Gunnerman would still occur, but it would not easily and ready as compared when it is involved with a surface active agent. Also, as discussed by Appellant on page 17 of the Brief, the limitation “in the absence” would tolerate for a small amount of the substance as low as 0.0003 % by volume. Gunnerman teaches that the ratio of mineral oil (surface active agent) to

Art Unit: 1764

liquid fossil (hydrocarbon feed) is ranging from 0.00003 to about 0.003. Therefore, the limitation “in the absence of a surface active agent” is encompassed by the reference.

Claims 78-88:

The argument that Gunnerman does not disclose that the process is operated in the absence of an oxidizing agent and there is no evidence supporting the motivation to modify Gunnerman to omit the use of an oxidizing agent is not persuasive. As discussed above, on page 17 of the Brief, the limitation “in the absence” would include a small amount of the substance as low as 0.0003 % by volume. Gunnerman teaches that the amount of the oxidizing agent used is from about 0.0003 % by volume as admitted by Appellant (see Gunnerman col. 4, lines 38-55). Therefore, the limitation “in the absence” is encompassed by the reference.

Claims 76 and 83-88:

The examiner verifies that Claims 76 and 83-88 is rejection under 103(a) not 102(b). It was typos.

The argument that Inoue patent does not teach heating a crude oil fraction and the Inoue patent teaches away from heating the crude oil fraction is not persuasive. Inoue teaches that the petroleum liquids is process without **substantially** heating the liquids. (See Inoue col. 1, lines, 32-33, and 51-64). Inoue prefers to operate the process without **substantially** heating the liquids to save energy. However, if the process is operated at a location wherein energy supply is ready and really cheap, one of skill in the art would heat the feed fraction to a desired temperature (does not need substantially heating) before processing because the pre-heating step would improve the efficiency and effectiveness of the process. The test for obviousness is what the teachings and disclosures of the prior art would have suggested to one of ordinary skill in the art,

Art Unit: 1764

even including **unpreferred** embodiments. *See In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976).

Claims 77-81:

For arguments under these Claims set, please see the response under Claims 76 and 83-88 above.

Claim 82:

For arguments under Claim 82, please see the response under Claims 76 and 83-88 above.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Tam Nguyen

Conferees:

Glenn Caldarola

Jennifer K. Michener

